



INV. TITLE: FULLY ARTICULATED AND COMPREHENSIVE AIR AND FLUID DISTRIBUTION,
METERING, AND CONTROL METHOD AND APPARATUS FOR PRIMARY MOVERS, HEAT
EXCHANGERS, AND TERMINAL FLOW DEVICES.
INV. NAME: DANIEL STANIMIROVIC
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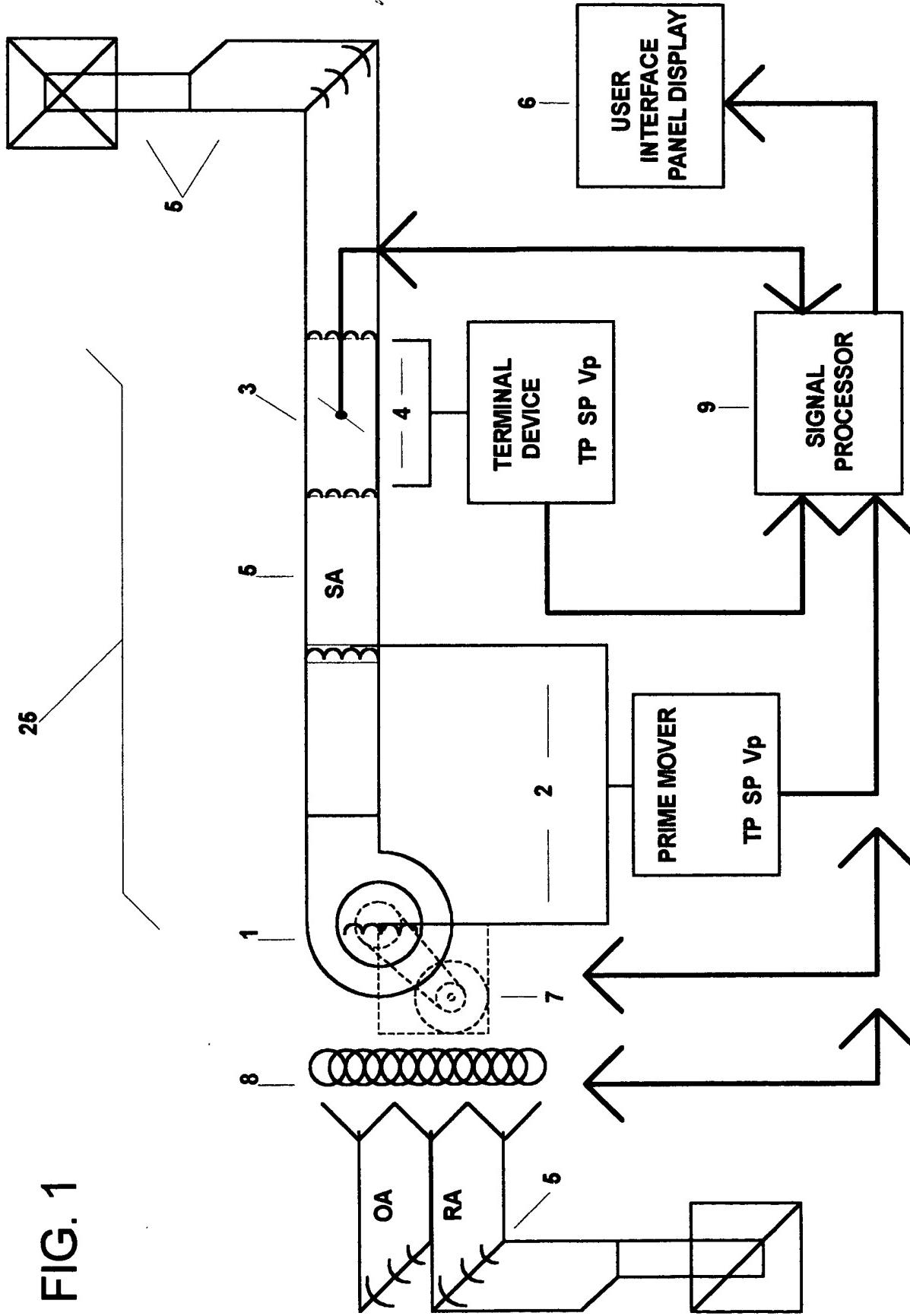


FIG. 1

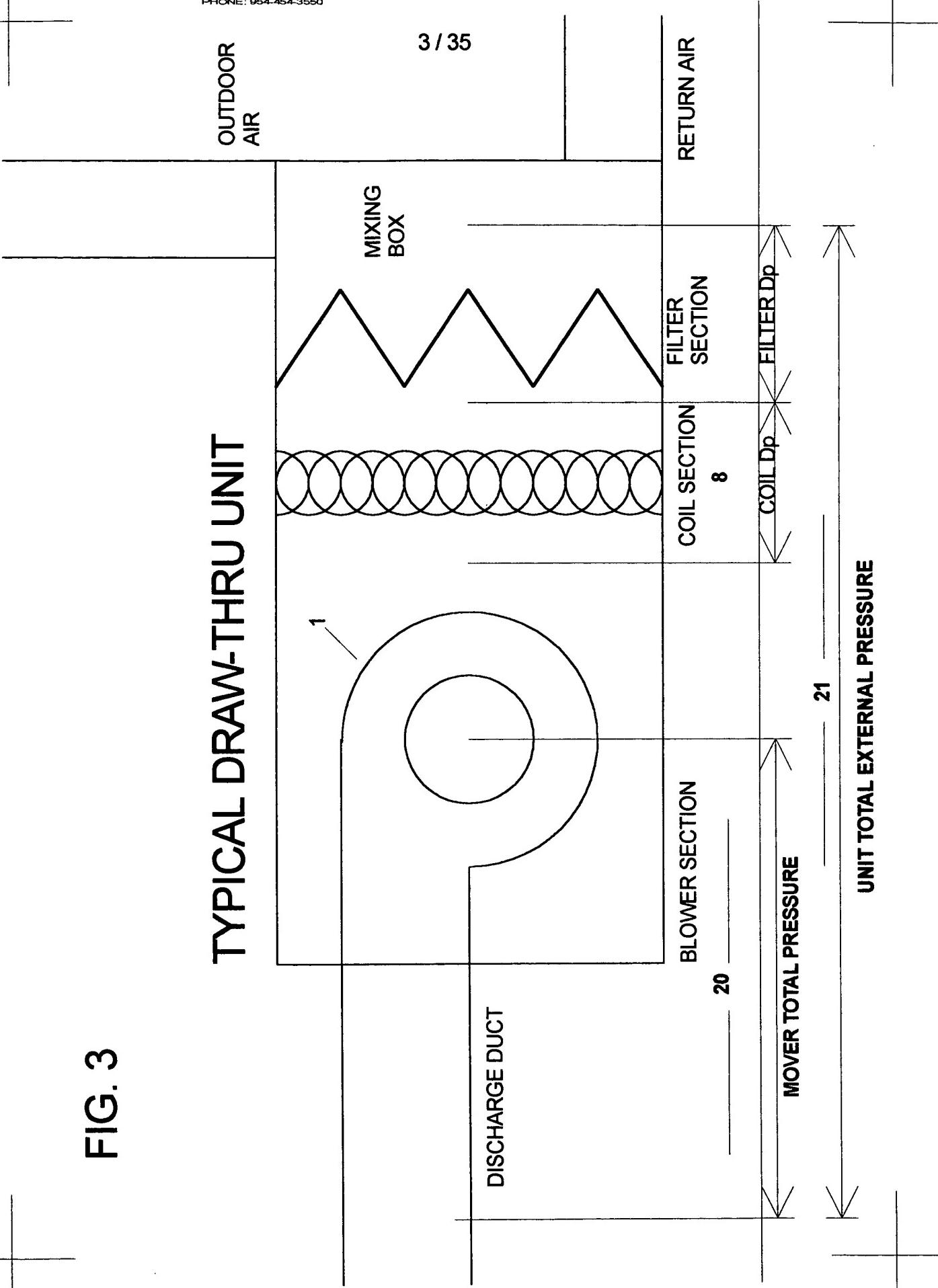
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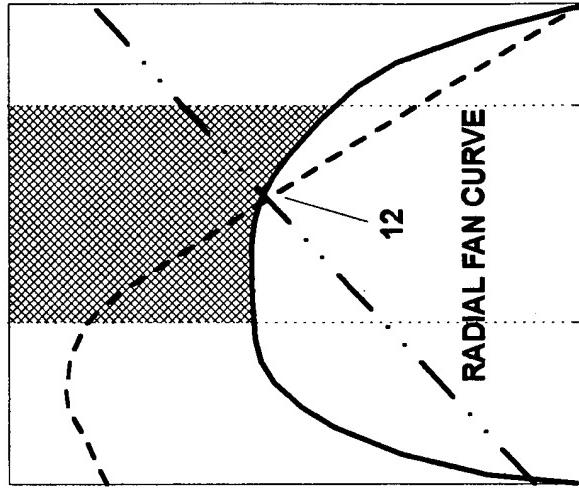
FIG. 3

TYPICAL DRAW-THRU UNIT



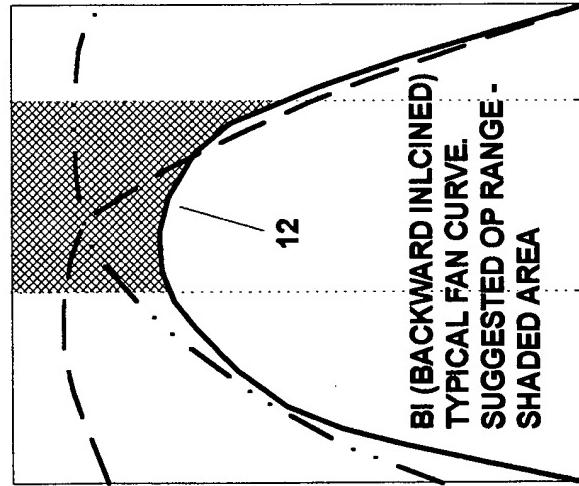
TRADITIONAL FAN PERFORMANCE CURVES

FIG. 5

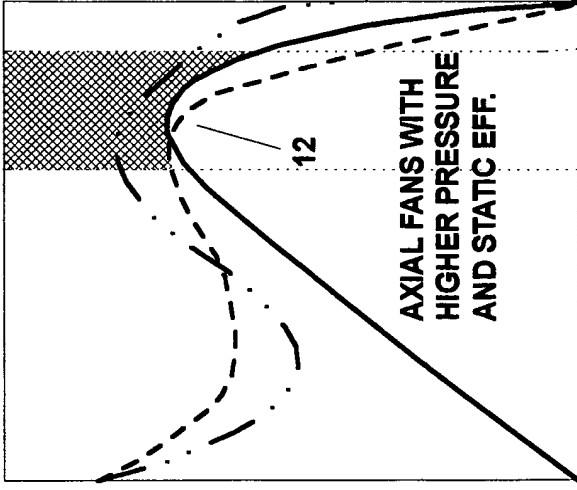


SP — — —
STATIC EFF. — — —
BHP — — —

SP CURVE OCCURS AT
SPECIFIED RPM AND IS THE
BASIS FOR DETERMINING OP
WHEN PLOTTED AGAINST
A GIVEN SYSTEM.



PROPELLER AND AXIAL FANS
HIGHER FLOW-VOLUME LOW
PRESSURE.



NEW METHOD SHALL FURTHER
BREAK DOWN THIS CURVE INTO
THE THREE KEY COMPONENTS
FOR ANALYSIS: SP, VP, TP

THIS WILL ALSO PROVIDE
THE BEST MEANS OF PAIRING A
PRIME MOVER AND ITS
SYSTEM FOR EQUIPMENT
SELECTION.

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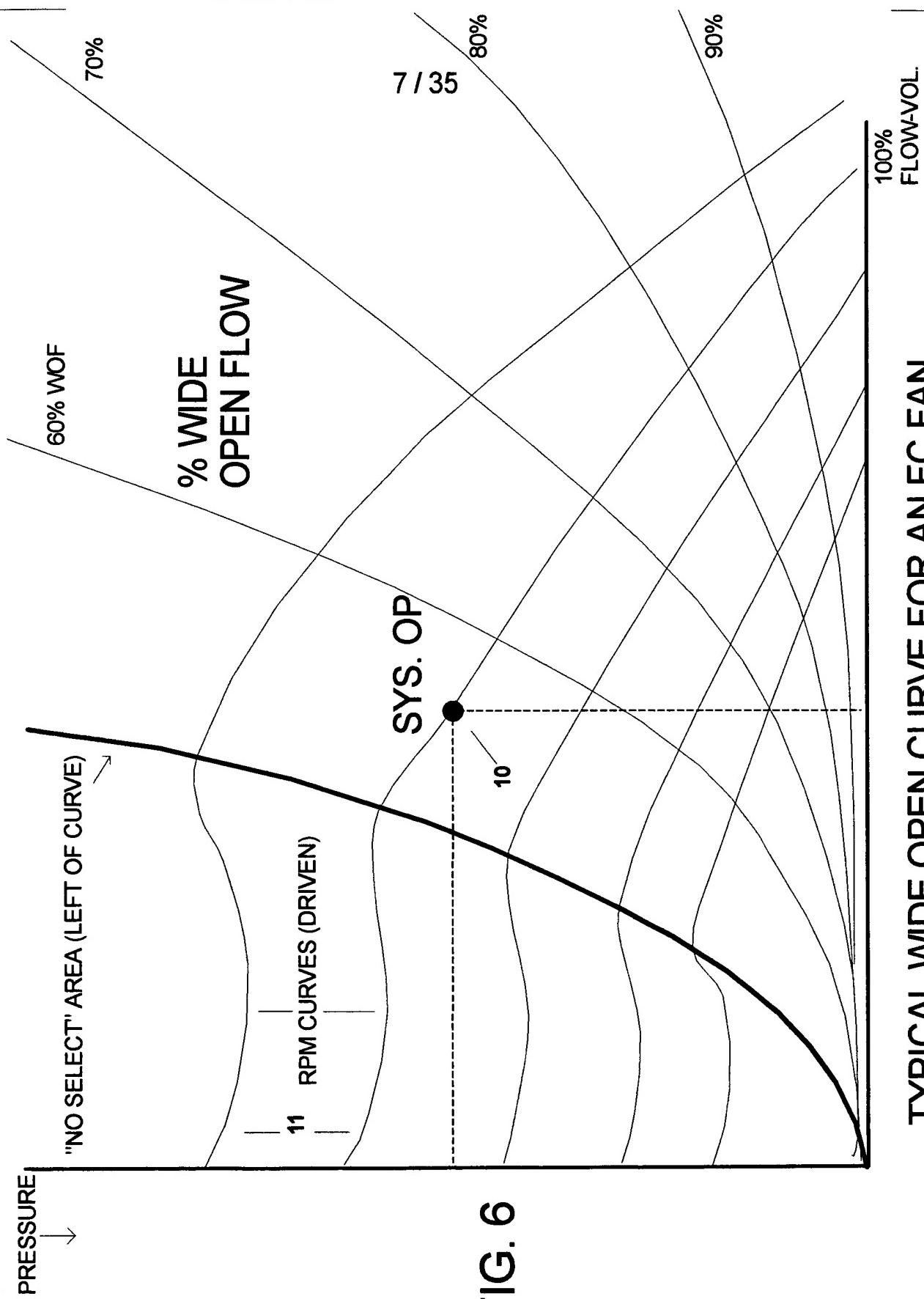


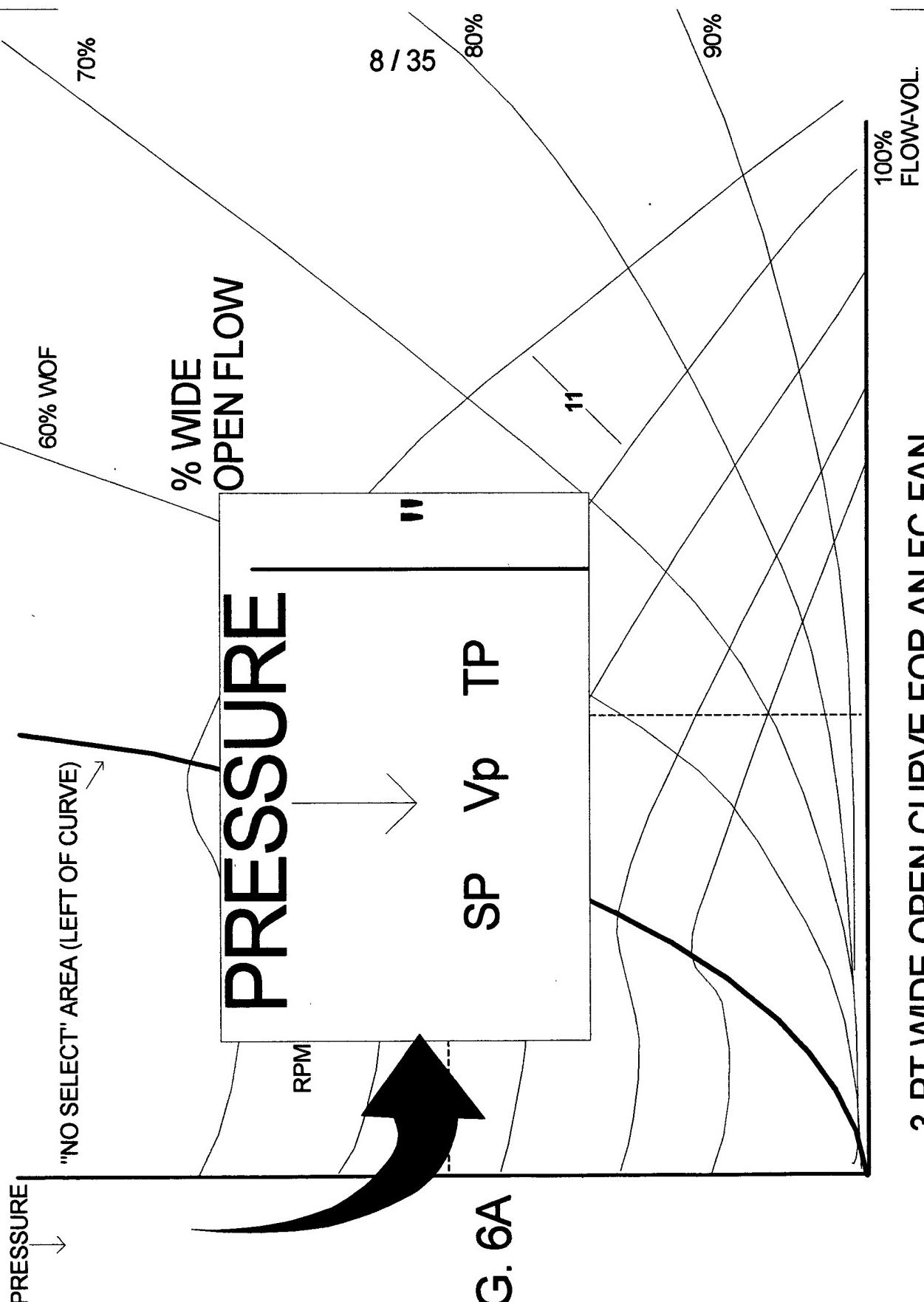
FIG. 6

TYPICAL WIDE OPEN CURVE FOR AN FC FAN

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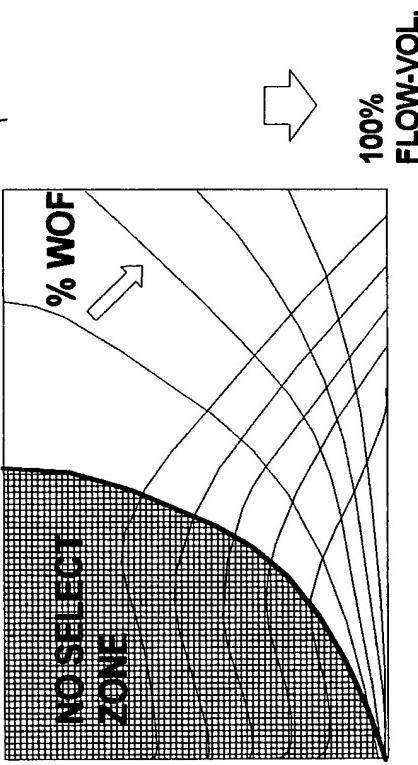
PHONE: 954-454-3550



3-PT WIDE OPEN CURVE FOR AN FC FAN

WIDE OPEN AND SYSTEM CURVES JUXTAPOSED

FIG. 7
KNOWN PRIME MOVER WOC



UNKNOWN TOTAL SYSTEM ATTACHED

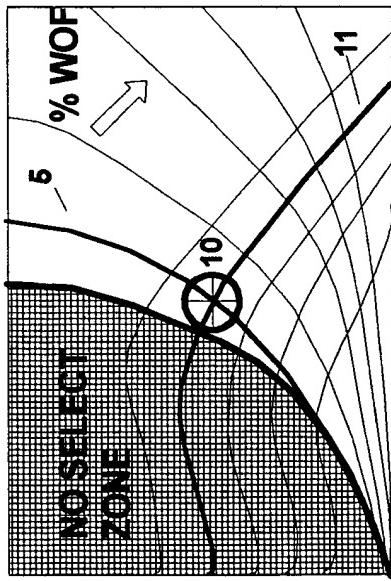
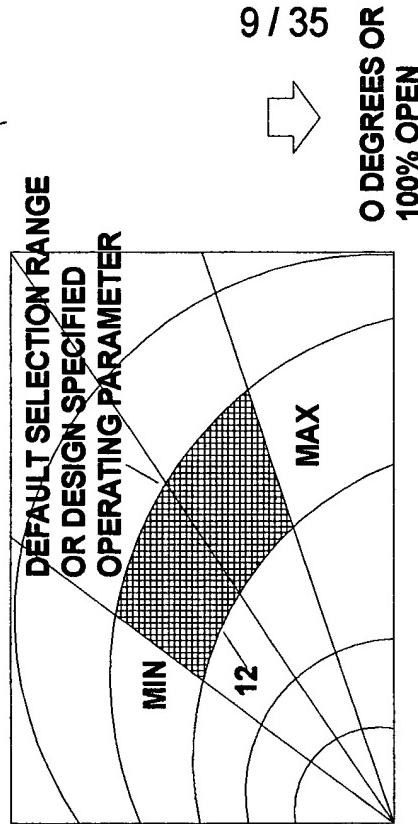
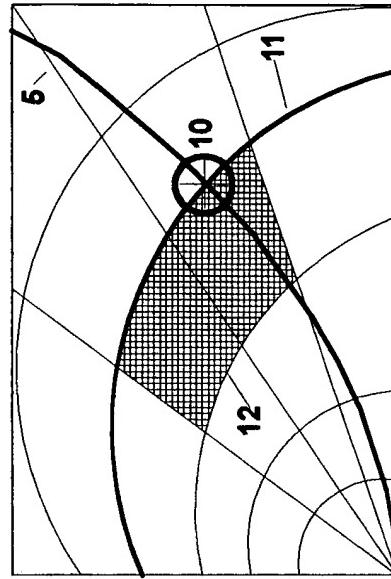


FIG. 7A

TERMINAL OR IN-LINE DEVICE WOC



UNKNOWN SUB-SYSTEM ATTACHED



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O DEGREES OR
100% OPEN

PRIMARY OR TERMINAL HEAT EXCHANGE

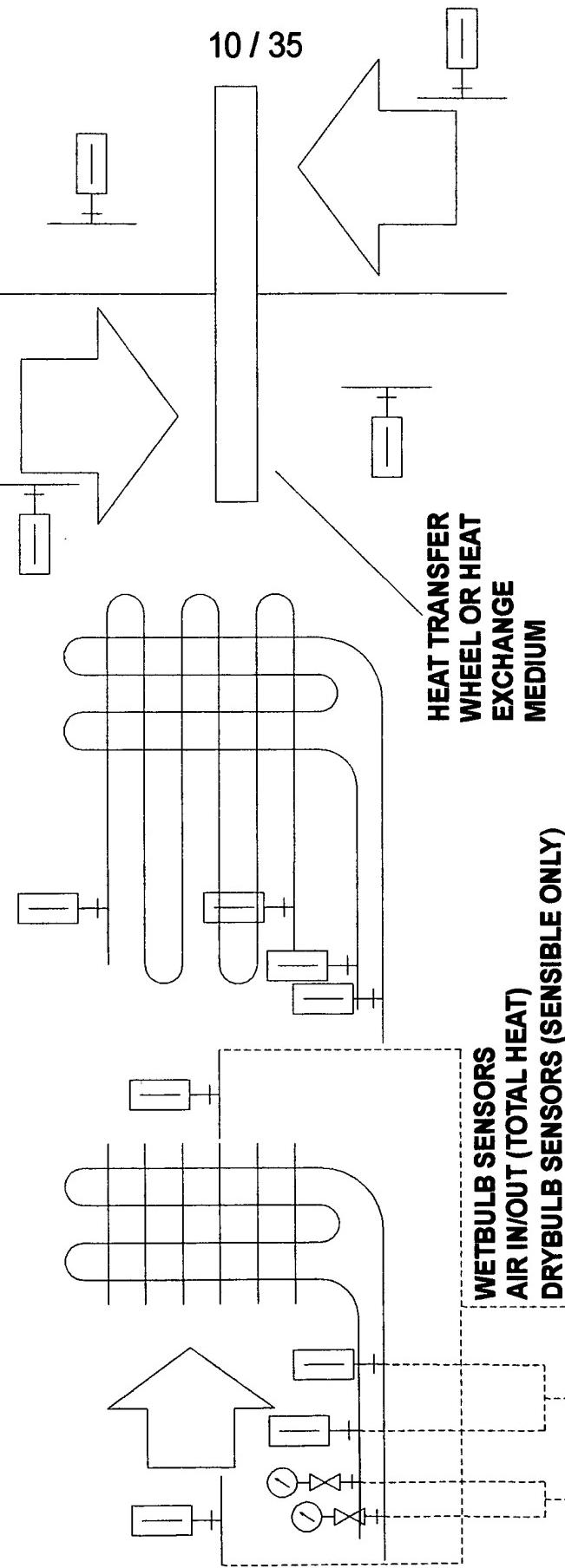
FIG. 8
AIR TO WATER

FIG. 8A
WATER TO WATER

FIG. 8B
AIR TO AIR

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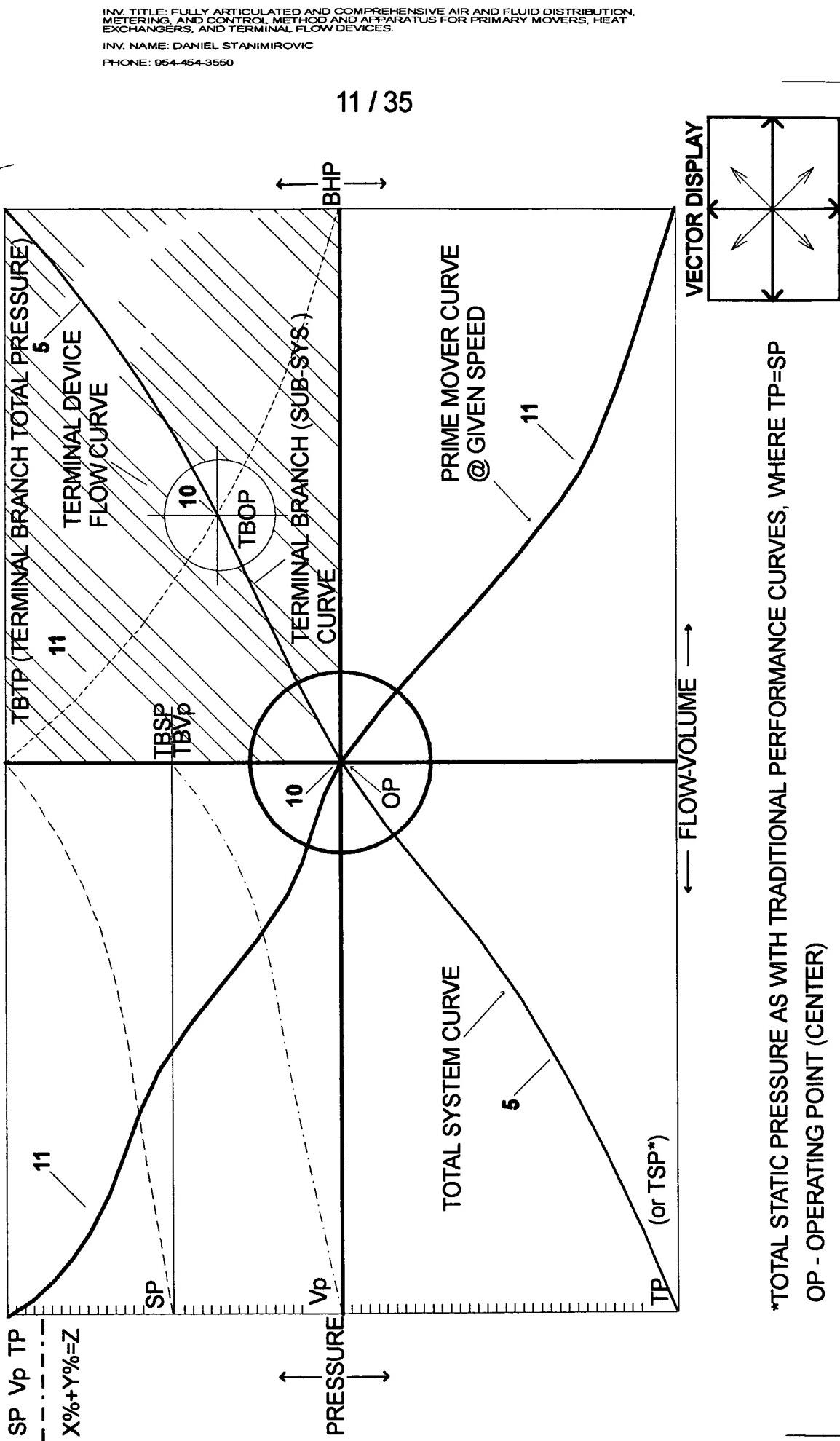
ENTERING AND LEAVING AIR TEMPERATURES IN COUNTER FLOW EXCHANGER

AIR-GAS-FLUIDS TO SAME FLUIDS TO FLUIDS GASES TO GASES FLUIDS TO GASES, VICE VERSA MIXTURES TO MIXTURES (ALL OF THE ABOVE)

*VARIATIONS WOULD INCLUDE THE FOLLOWING IN ANY ARRANGEMENT, FORM, NUMBER, OR COMBINATION:

FIG. 9

MAIN PANEL DISPLAY

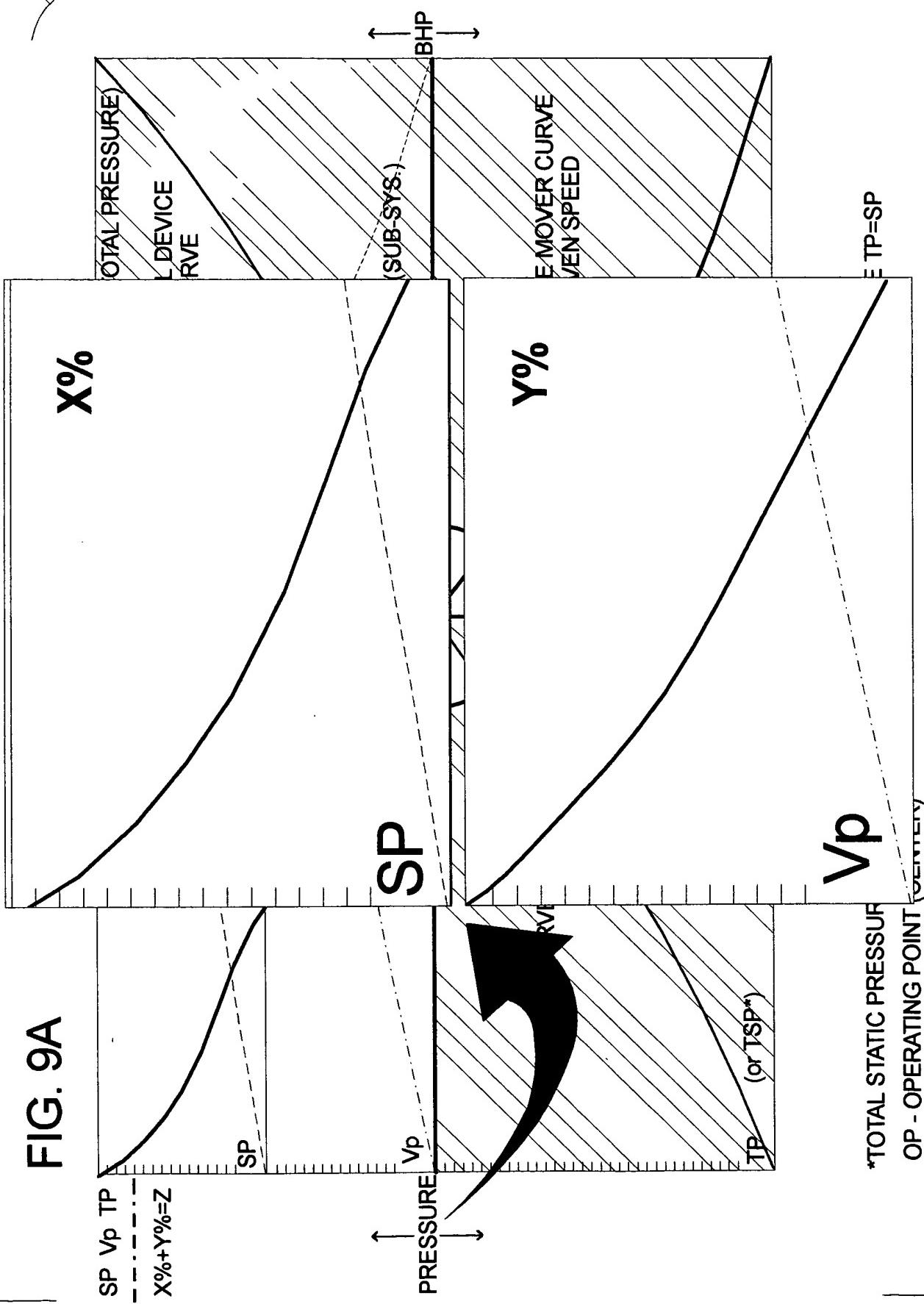


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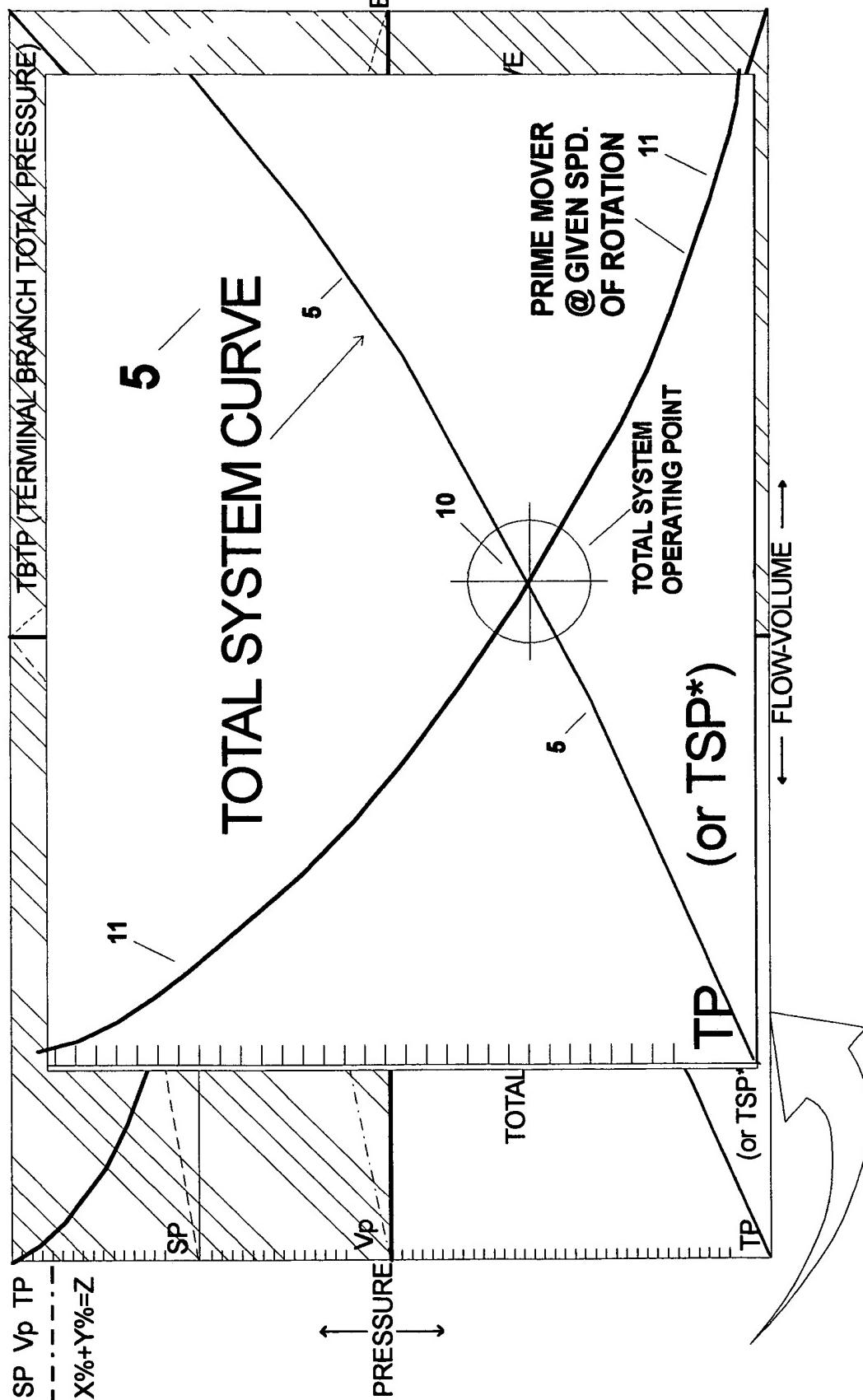
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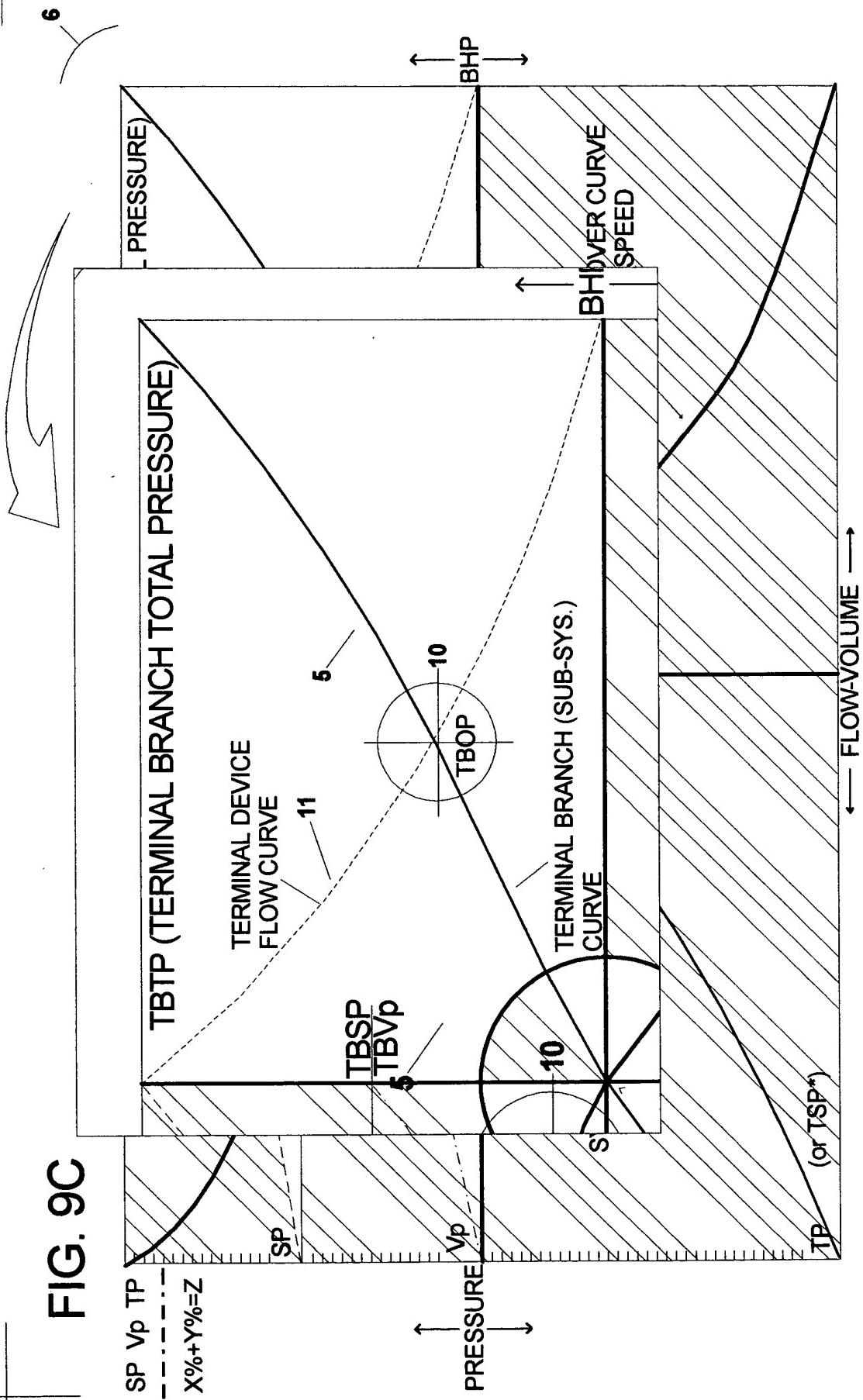
FIG. 9B



*TOTAL STATIC PRESSURE AS WITH TRADITIONAL PERFORMANCE CURVES, WHERE TP=SP
OP - OPERATING POINT (CENTER)

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FIG. 9C



*TOTAL STATIC PRESSURE AS WITH TRADITIONAL PERFORMANCE CURVES, WHERE TP=SP
OP - OPERATING POINT (CENTER)

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FIG. 10 3-PART SYSTEM CURVES VIEWED INDEPENDENTLY

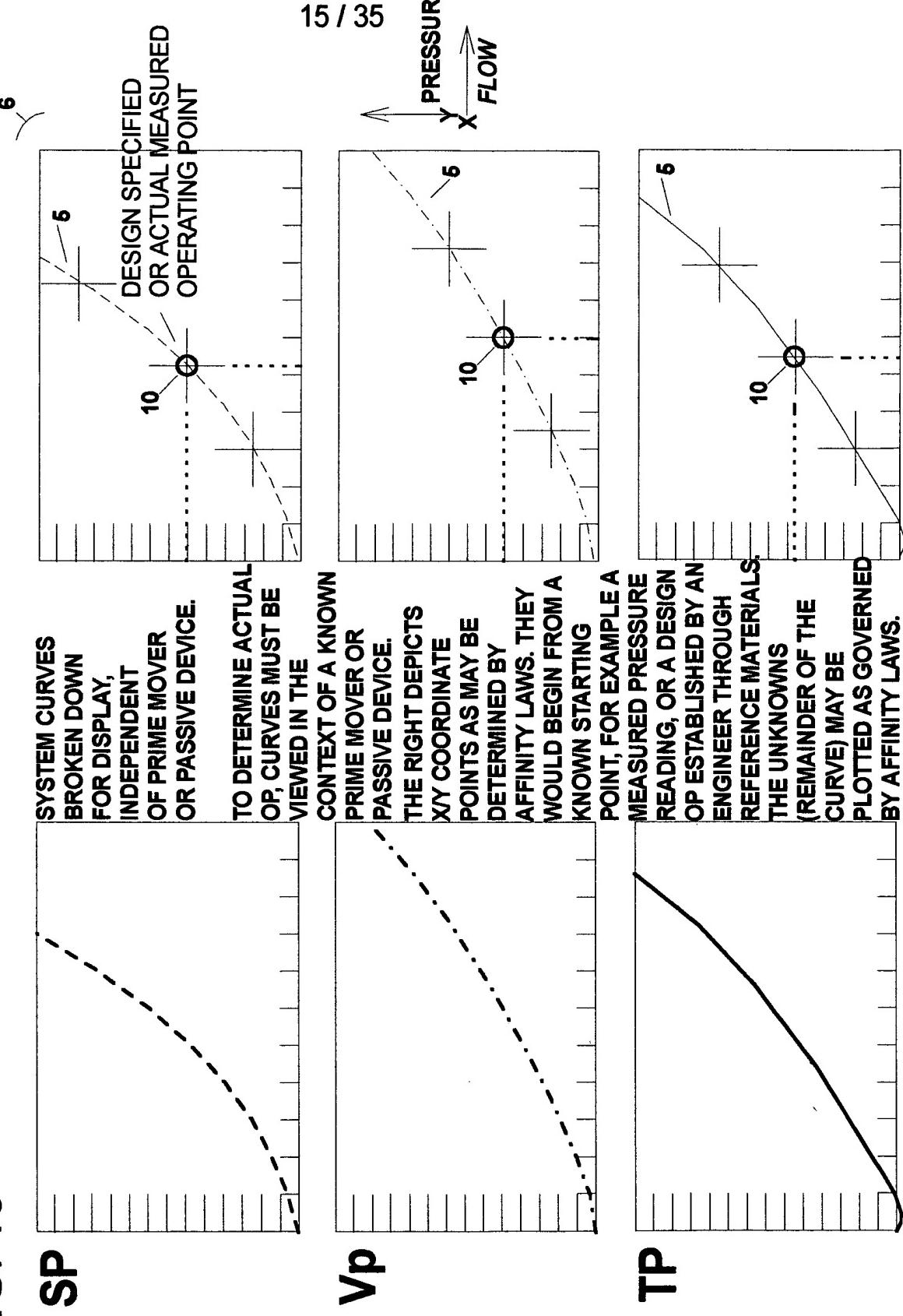
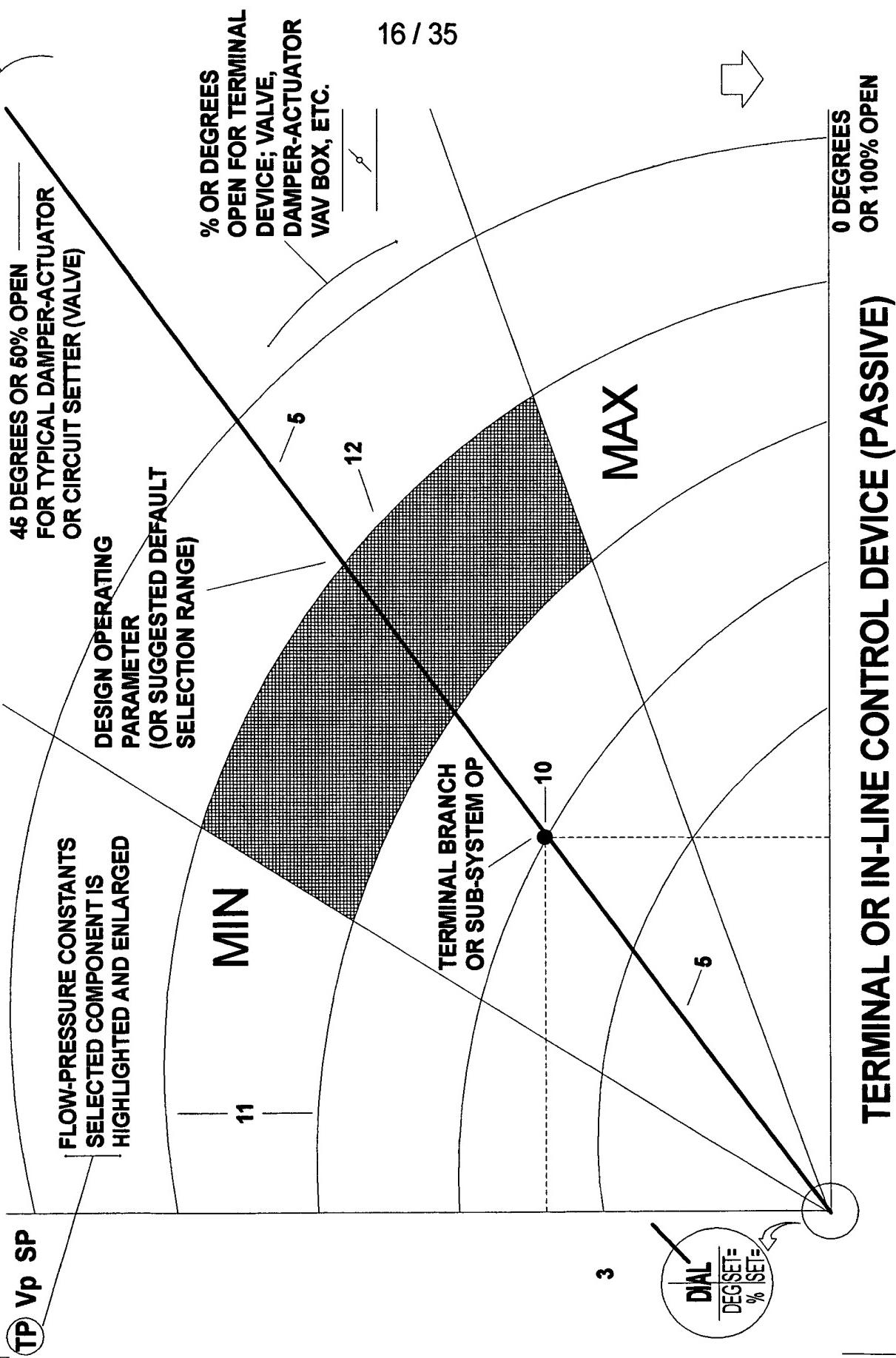


FIG. 11

TERMINAL DEVICE (WOC) WIDE OPEN CURVE



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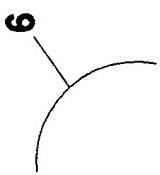
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CURVE RIDING AND OP DEVIATION

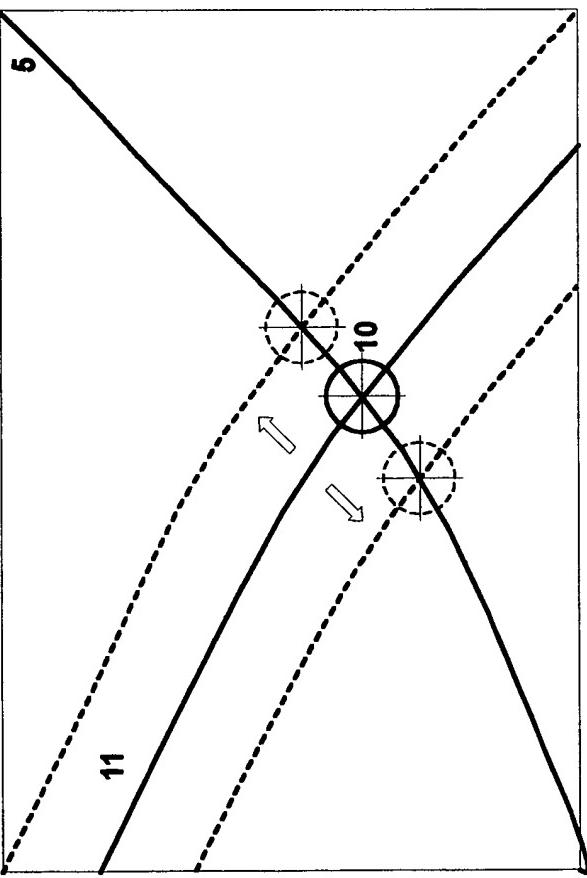
FIG. 12A



SYSTEM CHANGES

TP SP V_p

FIG. 12



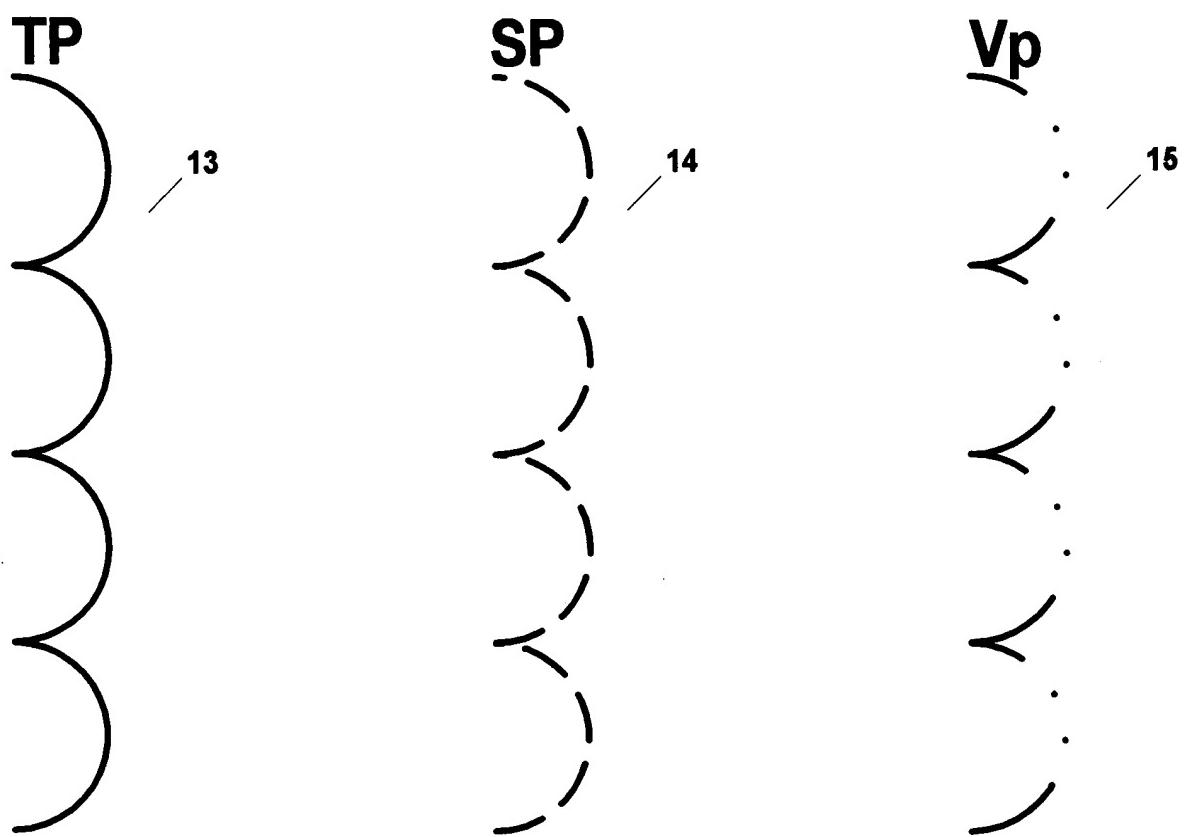
PRIME MOVER CHANGES

ROTATIONAL SPEED
SECONDARY MOVER

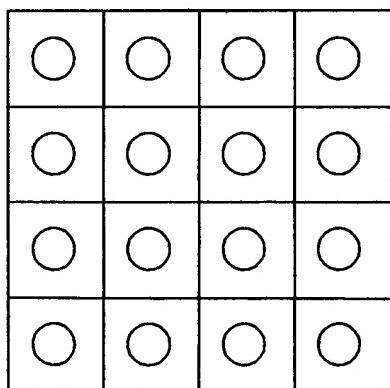
SERIES OR PARALLEL
OPERATION

FIG. 13

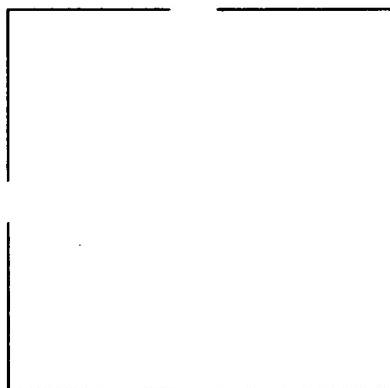
SENSOR LOGIC



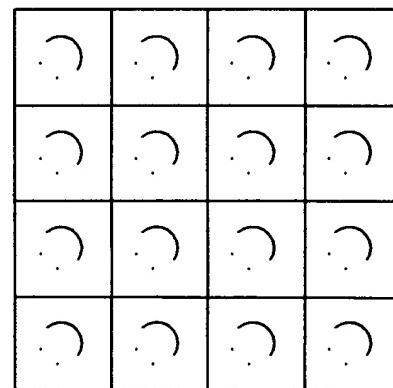
DUCT CROSS-SECTIONAL EQUAL AREA TRAVERSE



TOTAL IMPACT SENSORS



STATIC ONLY SENSORS



VELOCITY ONLY SENSORS

TP-SP, AS WITH PITOT TUBE

PRIME MOVER SENSOR LOGIC

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FIG. 14

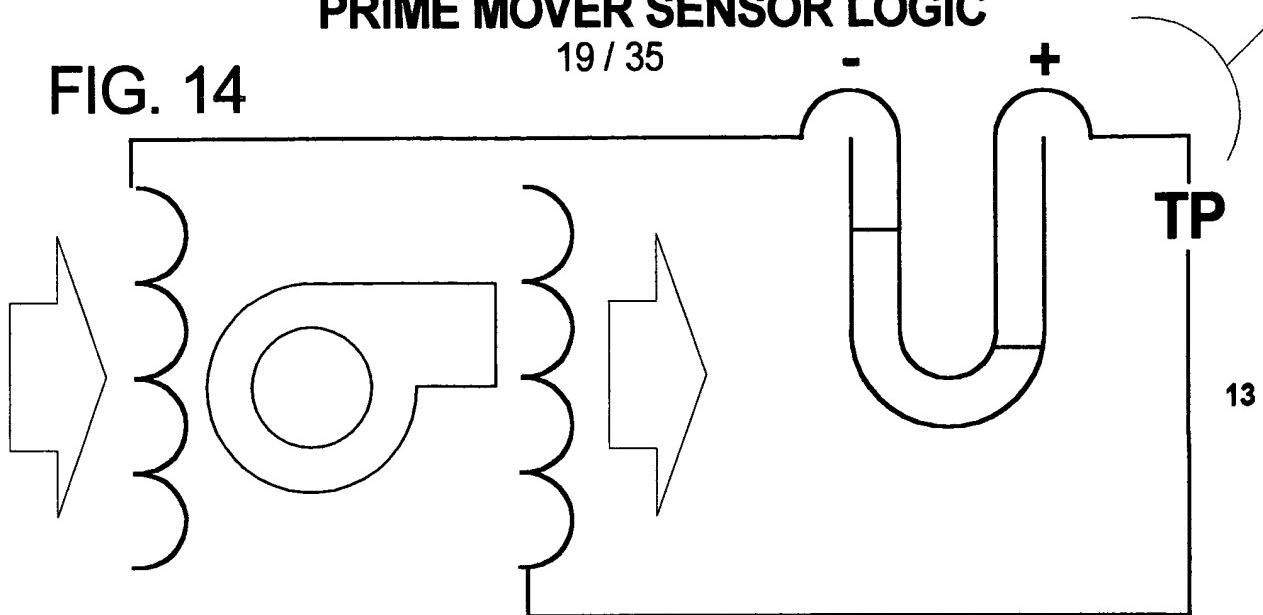


FIG. 14A

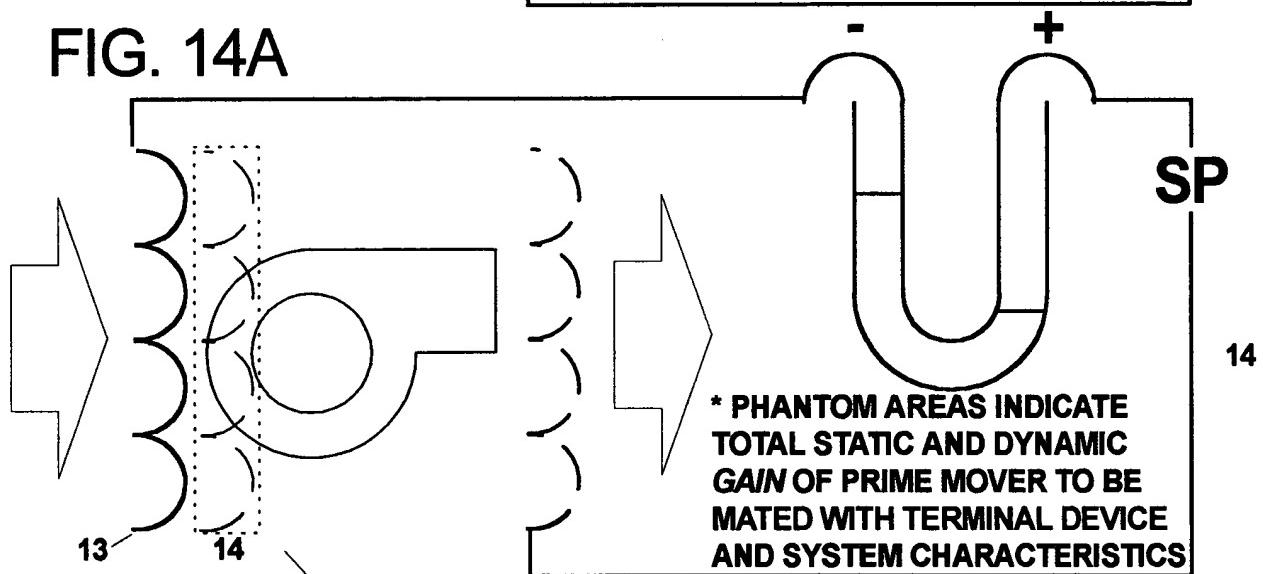
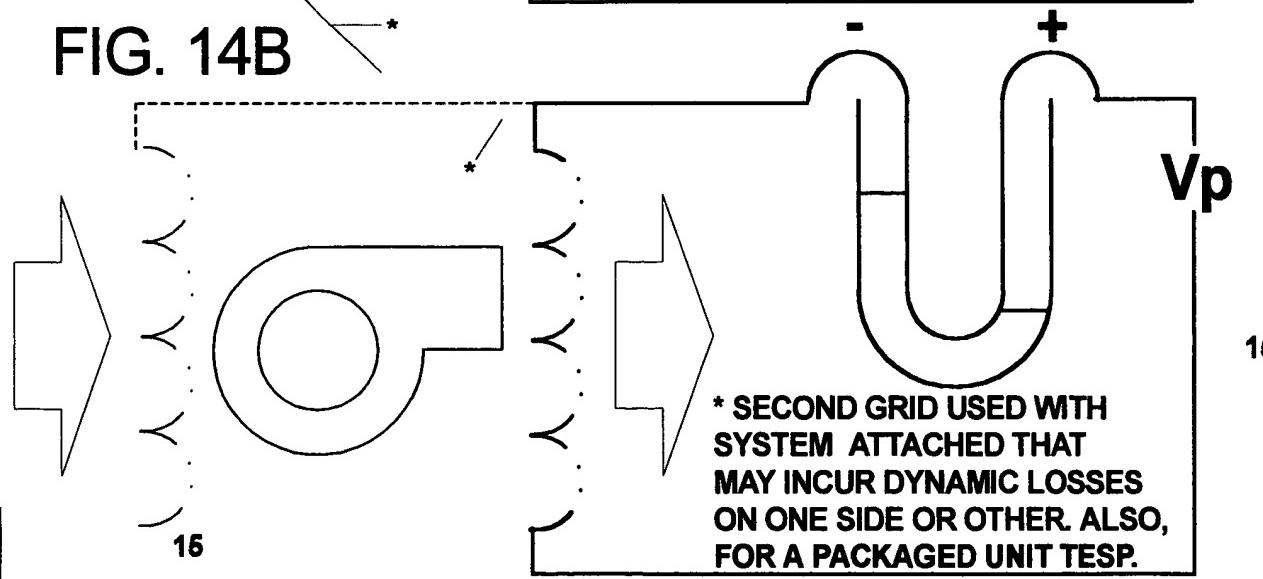


FIG. 14B

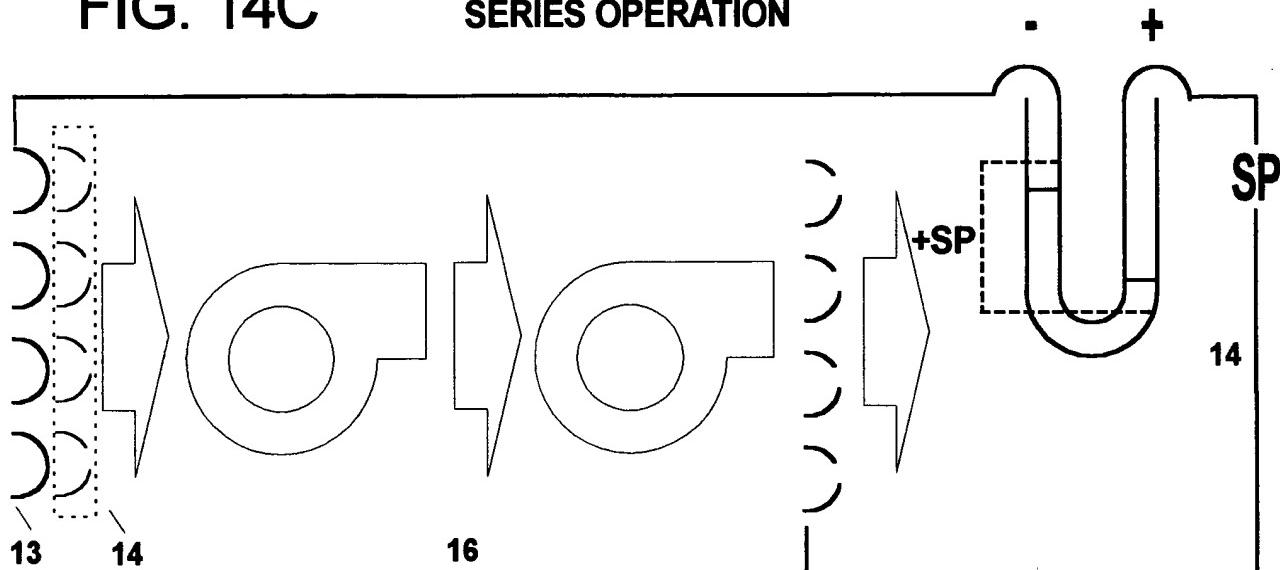


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MOVER SENSOR LOGIC IN SERIES OR PARALLEL OPERATION

FIG. 14C

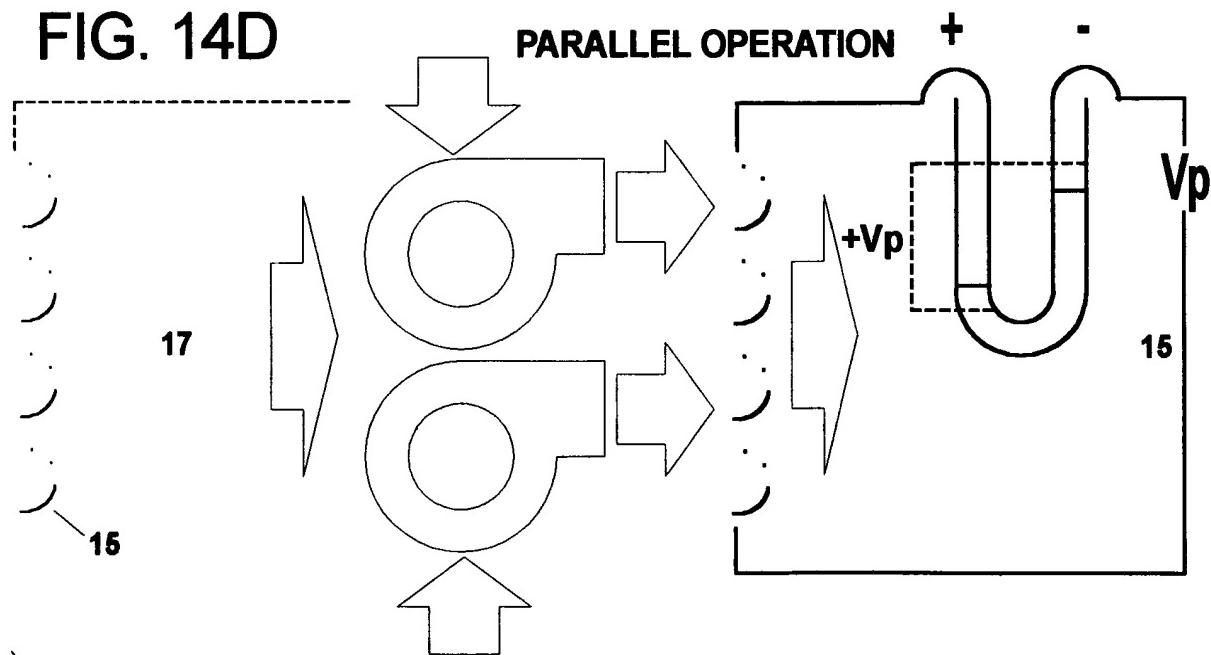
SERIES OPERATION



ONE OR MORE PRIMARY MOVERS IN SERIES OR PARALLEL
AUGMENT EITHER SP OR V_p, RESPECTIVELY, AS SHOWN.

FIG. 14D

PARALLEL OPERATION



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TERMINAL DEVICE SENSOR LOGIC

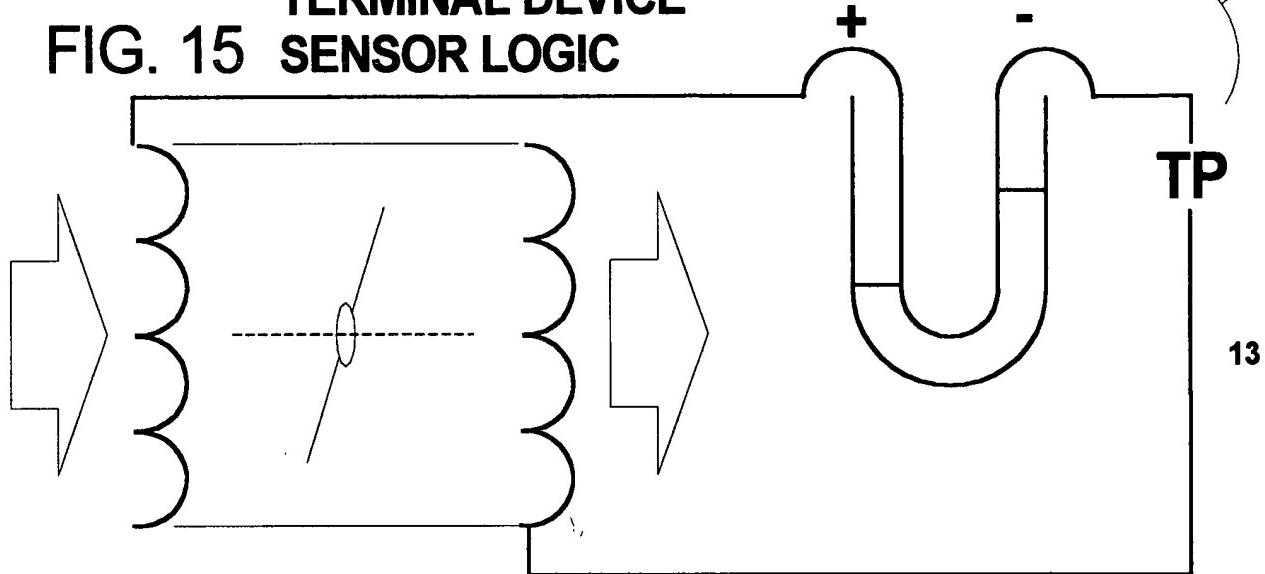


FIG. 15A

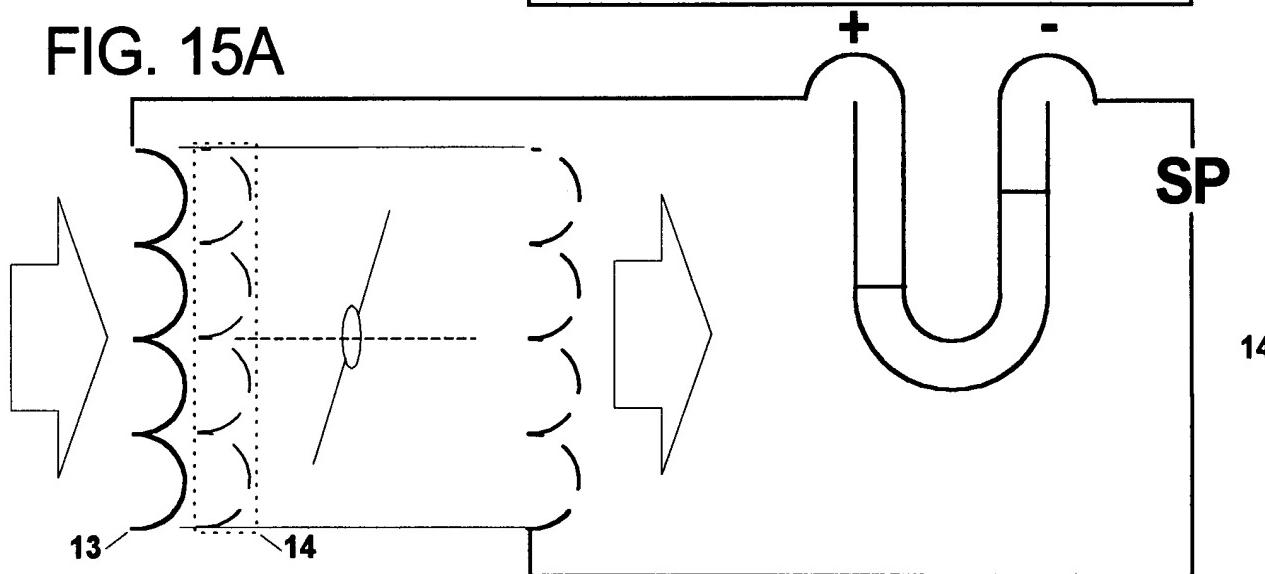
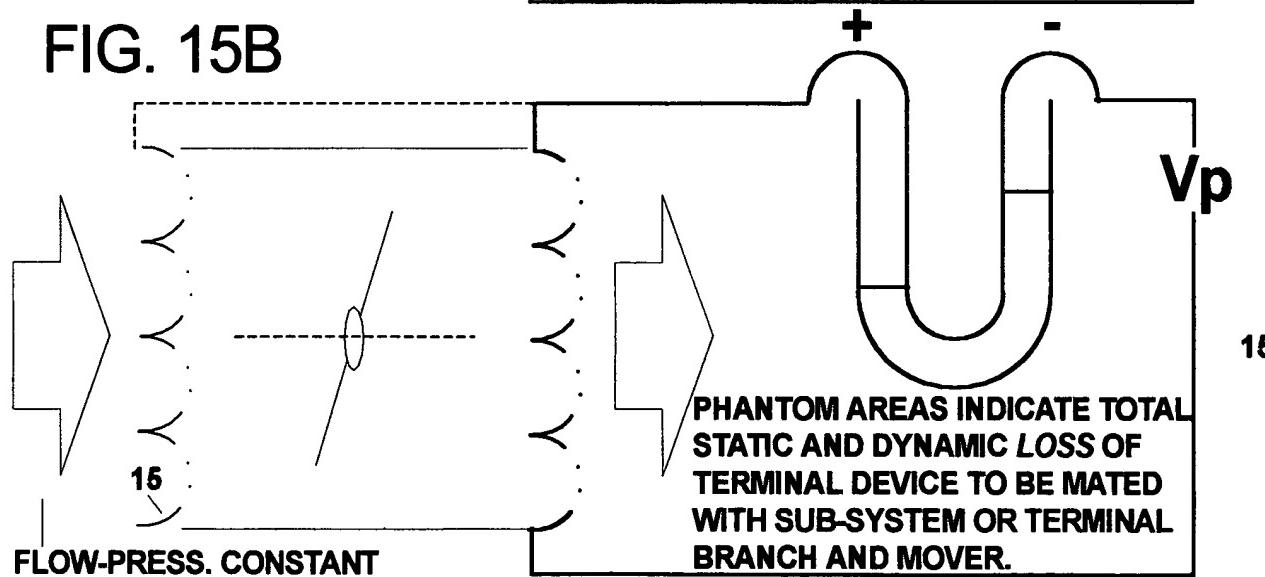
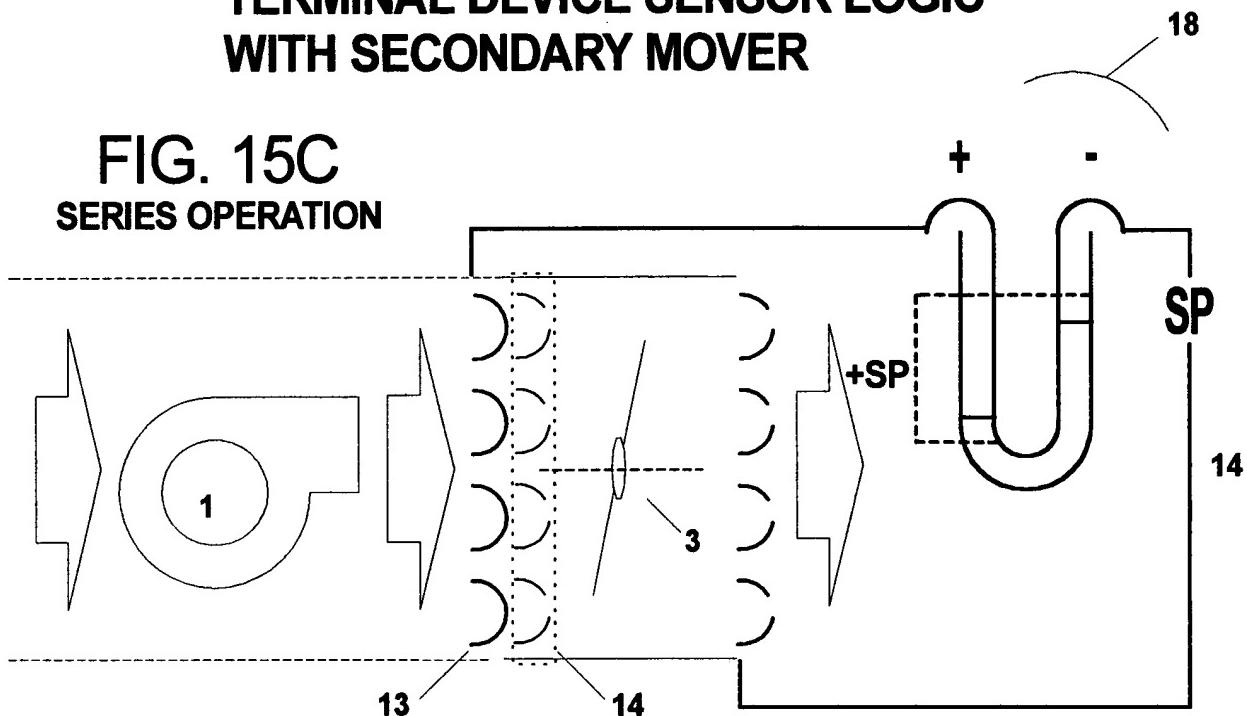


FIG. 15B



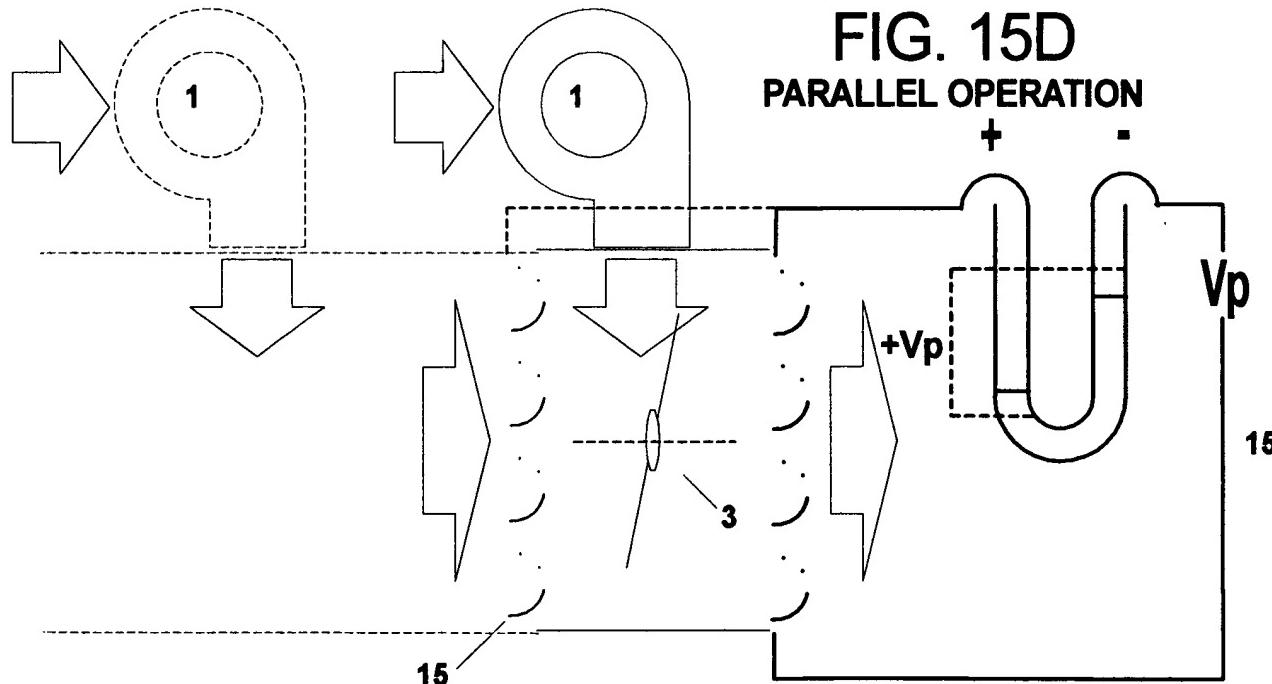
TERMINAL DEVICE SENSOR LOGIC WITH SECONDARY MOVER

FIG. 15C
SERIES OPERATION



ONE OR MORE SECONDARY MOVERS IN SERIES OR PARALLEL
AUGMENT EITHER SP OR V_p, RESPECTIVELY, AS SHOWN.

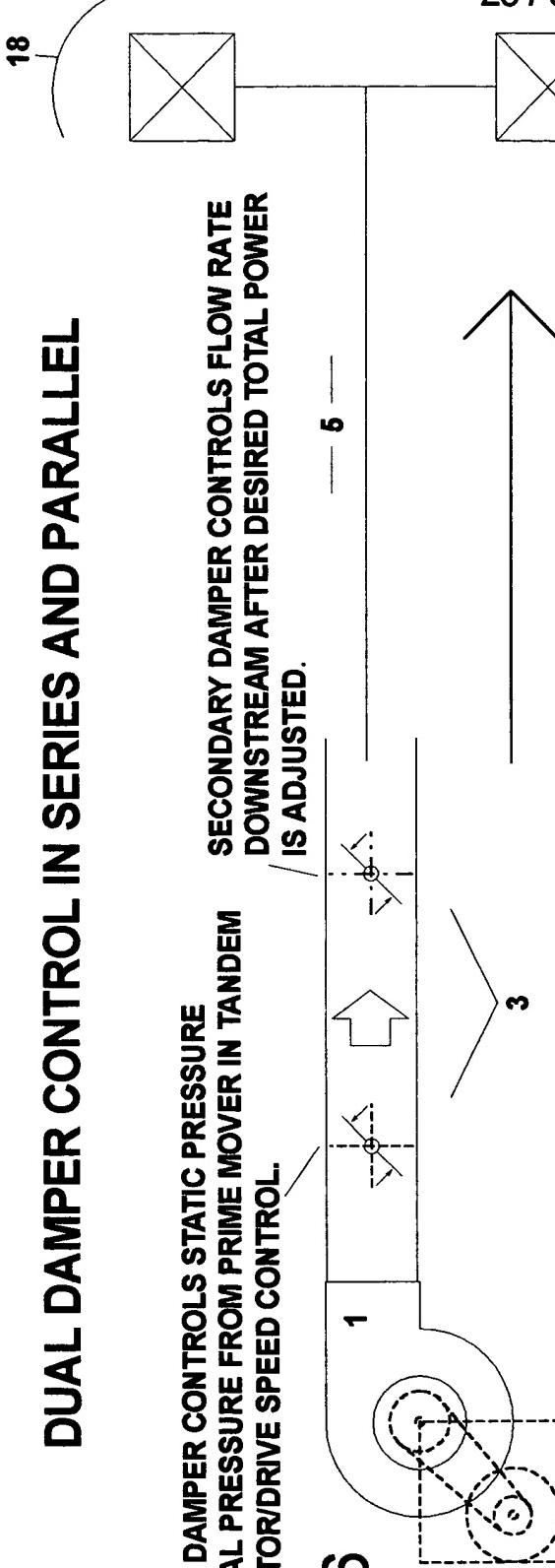
FIG. 15D
PARALLEL OPERATION



DUAL DAMPER CONTROL IN SERIES AND PARALLEL

**PRIMARY DAMPER CONTROLS STATIC PRESSURE
AND TOTAL PRESSURE FROM PRIME MOVER IN TANDEM
WITH MOTOR/DRIVE SPEED CONTROL.**

FIG. 16



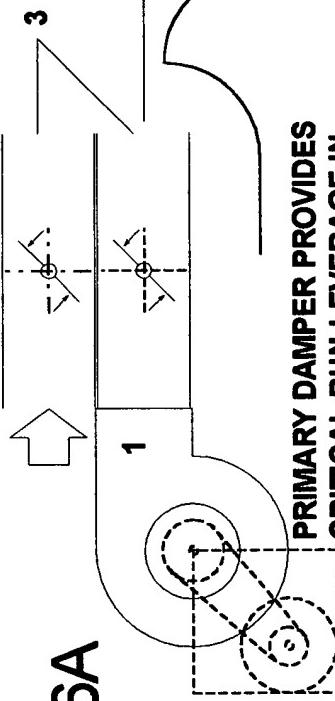
**SECONDARY DAMPER CONTROLS FLOW RATE
DOWNSTREAM AFTER DESIRED TOTAL POWER
IS ADJUSTED.**

FIG. 16A

**PARALLEL DAMPER AND FLOW
SOURCE PROVIDES CUMULATIVE
VELOCITY TO TRAVERSE FITTING
AND DIRECTIONAL LOSSES**

7

FIG. 16A

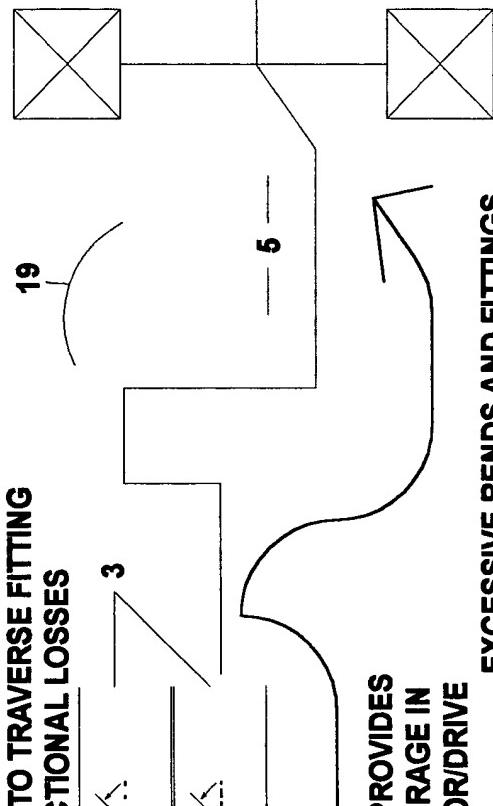


**PRIMARY DAMPER PROVIDES
CRITICAL RUN LEVERAGE IN
TANDEM WITH MOTOR/DRIVE
SPEED CONTROL**

7

EXCESSIVE BENDS AND FITTINGS

LONG RUNS, MINIMAL FITTINGS



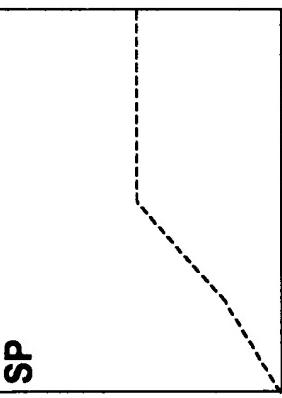
19

5

LEAKAGE TESTER

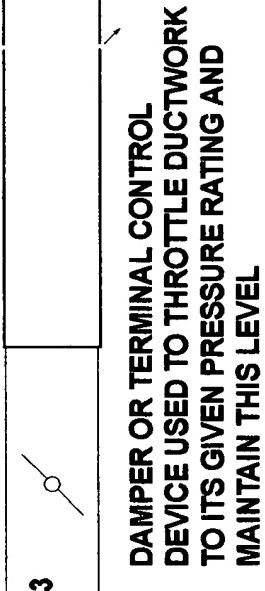
SP LEVEL ADJUSTED TO
DUCTWORK RATING TO
PERFORM STANDARD
TEST FOR GIVEN SECTION

FIG. 17



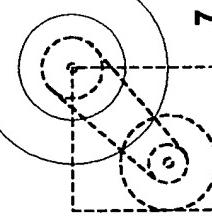
V_p CURVE LEVEL OFF INDICATES
LEAKAGE AMOUNT PER SURFACE
AREA OF DUCT

FIG. 17A



DAMPER OR TERMINAL CONTROL
DEVICE USED TO THROTTLE DUCTWORK
TO ITS GIVEN PRESSURE RATING AND
MAINTAIN THIS LEVEL

OUTLETS/INLETS AND OTHER
JOINTS MAY BE CAPPED IN A
NEW OR EXISTING SYSTEM THAT
HAS ALREADY BEEN FITTED. THIS
MAY BE VIEWED AS A TOTAL OR
TERMINAL SYSTEM WITH ITS OWN
PRE-ESTABLISHED CURVE. LEAKAGE
REPRESENTED BY V_p DEVIATIONS
(INCREASES) FROM A FIRMLY
ESTABLISHED OPERATING POINT.
SEE FIG. 12, 12A, OP DEVIATION.



OPT. MOTOR
SPD. CTRL.

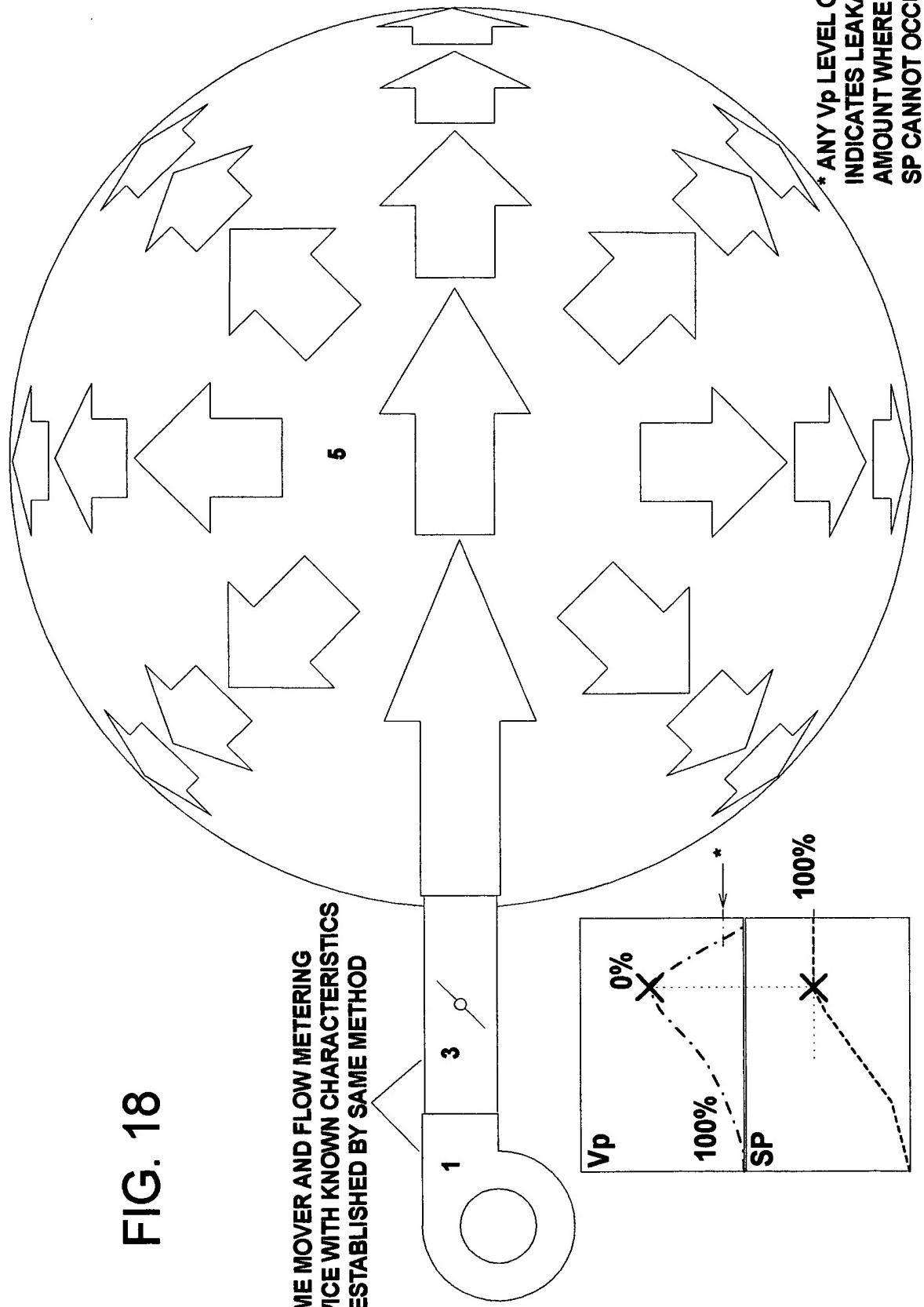
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VOLUME OF A GIVEN VESSEL OR ENCLOSURE

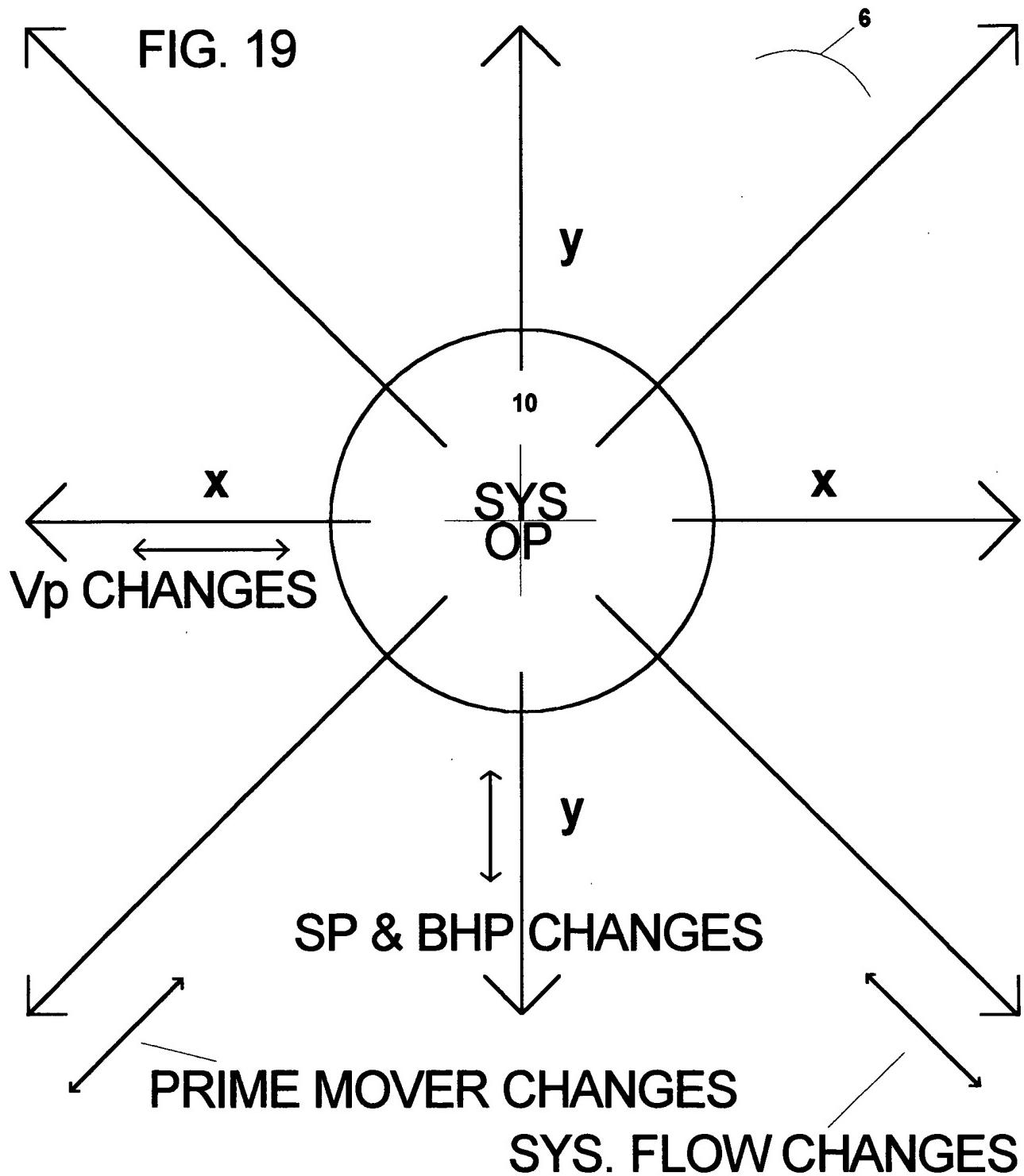
FIG. 18

PRIME MOVER AND FLOW METERING
DEVICE WITH KNOWN CHARACTERISTICS
AS ESTABLISHED BY SAME METHOD



VECTORIAL DISPLAY

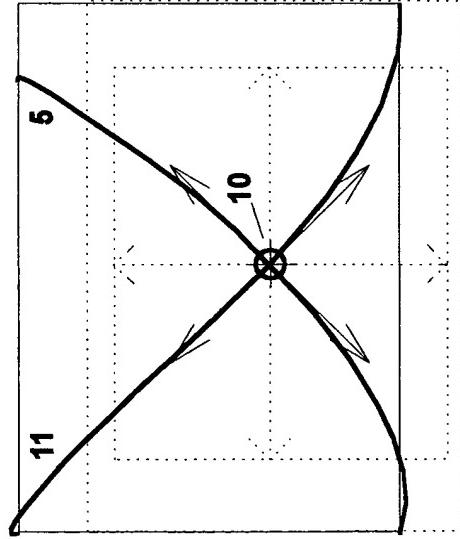
FIG. 19



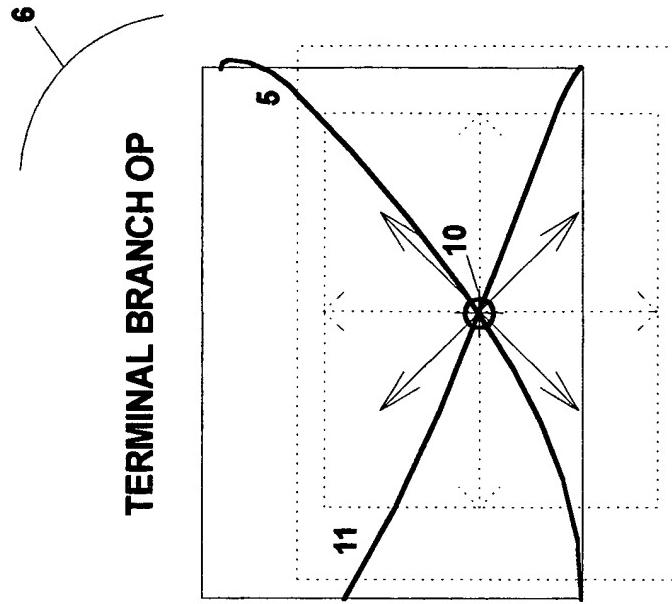
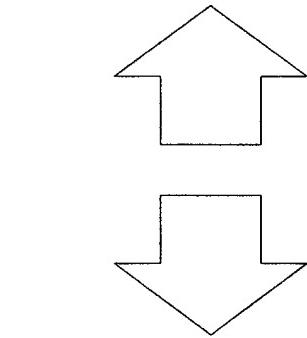
VECTORIAL ANALYSIS - TOTAL SYSTEM TO SUB-SYSTEM

FIG. 19A

TOTAL SYSTEM OP

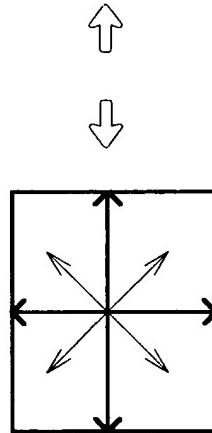
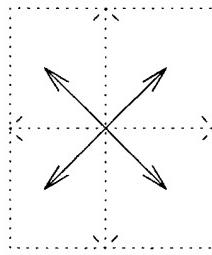


TERMINAL BRANCH OP



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SHOWN HERE, A CORRELATIVE EFFECT BETWEEN A TOTAL SYSTEM AND ITS SUB-BRANCH AS THE CHANGE IN ONE AFFECTS THE OTHER, EITHER ADVERSELY OR BENEFICIALLY. THE VECTORIAL ANALYSIS PROVIDES A "BARE BONES" DEPICTION OF EACH SPECIFIC CHANGE EFFECTED IN ONE OR THE OTHER SYSTEM. FOR EXAMPLE, THERE WAS AN X INCREASE IN BHP WHEN A DAMPER WAS CLOSED IN THE SUB-BRANCH.

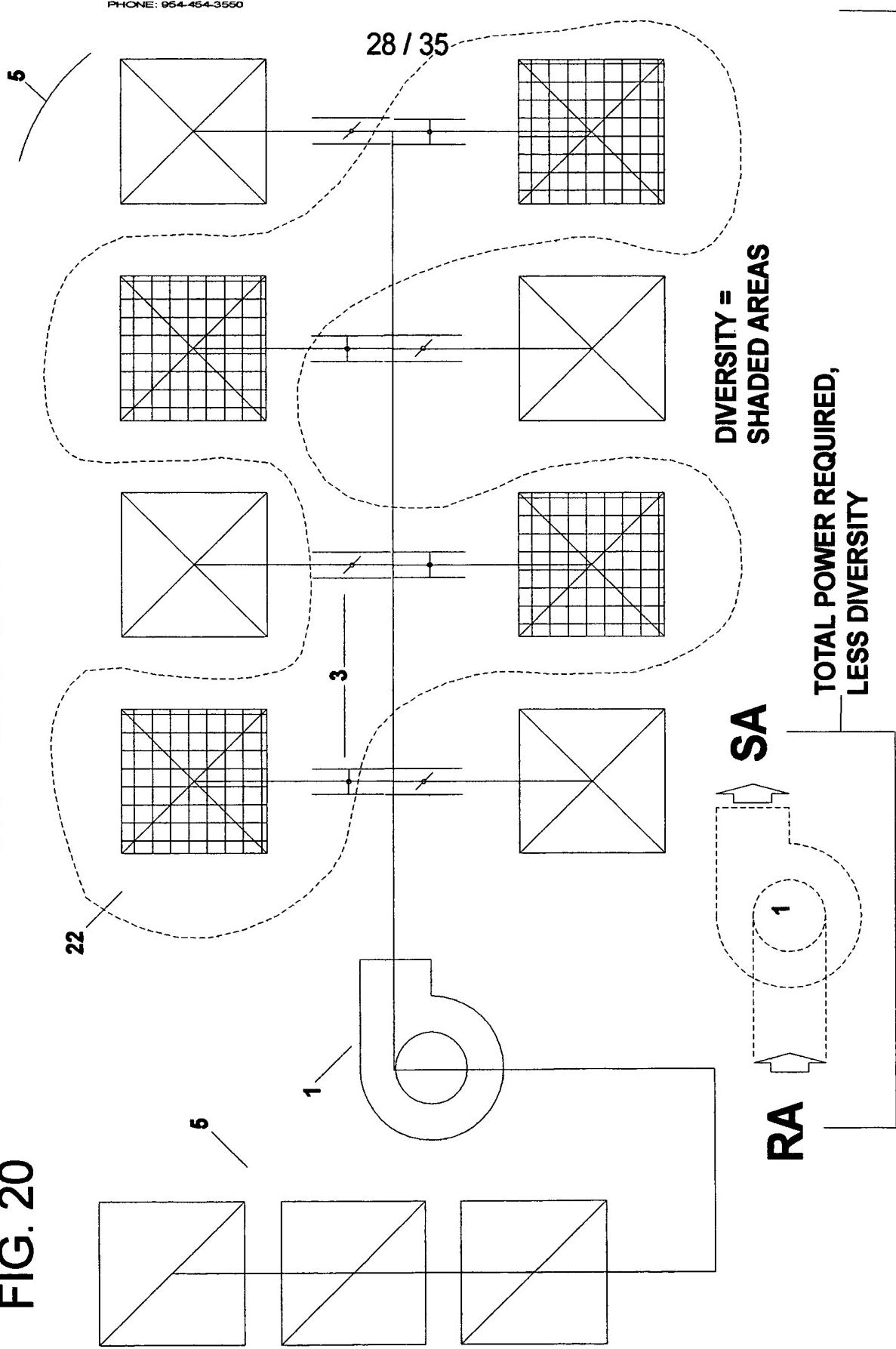


SWITCH TO OR FROM MAIN
VECTORIAL DISPLAY SCREEN
REFER TO FIG. 9

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FIG. 20

SYSTEM DIVERSITY



INDEPENDENT SYSTEM CURVES (PRESSURE / HEAD)

